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CLAIMS

1. An optical system comprising:

a substantially planar substrate; and

a waveguide channel at least a portion of which is at least partially buried in said substrate, said waveguide channel having a portion exhibiting a taper in two dimensions.

2. The optical system of claim 1, wherein said waveguide channel defines an optical axis and lacks continuous rotational symmetry about said optical axis.

3. The optical system of claim 1, wherein said waveguide channel is elongate along a light propagation path of said waveguide channel; and

said substrate is shaped to accommodate an optical component aligned with said light propagation path.

4. The optical system of claim 1, wherein said substrate defines a locating contour, said locating contour being adapted to engage an optical component such that engagement of the optical component with said locating contour positions the optical component for optically communicating with said waveguide channel.

5. The optical system of claim 1, wherein said waveguide channel is entirely buried in said substrate.

6. The optical system of claim 1, further comprising:

an input transmission medium optically communicating with said waveguide channel, said input transmission medium being configured to propagate light to said waveguide channel; and

an output transmission medium optically communicating with said waveguide channel, said output transmission medium being configured to propagate light from said waveguide channel.

7. The optical system of claim 1, wherein said waveguide channel is a first waveguide channel; and

said optical system further comprises:

a second waveguide channel at least a portion of which is at least partially buried in said substrate, said second waveguide channel having a portion exhibiting a taper in two dimensions.

8. The optical system of claim 7, further comprising:

means for propagating light between said first waveguide channel and said second waveguide channel.

9. The optical system of claim 1, wherein said waveguide channel includes a first waveguide channel portion, a second waveguide channel portion and a linking portion located along a light propagation path between said first waveguide channel portion and said second waveguide channel portion, said linking portion being at least partially buried in said substrate, said linking portion being adapted to propagate light between said first waveguide channel portion and said second waveguide channel portion.

10. The optical system of claim 9, wherein a trench is formed through at least a portion of said linking portion, said trench being adapted to receive an optical component.

11. The optical system of claim 10, further comprising:

an optical component arranged at least partially within said trench, said optical component being adapted to propagate light between said first waveguide channel portion and said second waveguide channel portion.

12. A method for forming an optical system, said method comprising:

providing a substrate;

depositing on the substrate a first contoured channel preform of material capable of ion exchange with the substrate; and

diffusing ions from the first channel preform into the substrate to form a first waveguide channel at least a portion of which is at least partially buried in the substrate.

13. The method of claim 12, wherein diffusing ions from the first channel preform into the substrate comprises:

providing an ionic liquid;

immersing the substrate with the deposited first channel preform in the ionic liquid such that a first portion of the ionic liquid engages the first channel preform and a second portion of the ionic liquid engages the substrate; and

applying an electric potential across the first portion and the second portion of the ionic liquid such that ions from the first channel preform diffuse into the substrate.

14. The method of claim 12, wherein in depositing the first channel preform, the first channel preform is contoured with a varying width.

15. The method of claim 12, wherein in depositing the first channel preform, the first channel preform is contoured with a varying height.

16. The method of claim 12, wherein in depositing the first channel preform, the first channel preform is contoured with both a varying width and height; and

wherein in diffusing ions from the first channel preform into the substrate, the first waveguide channel at least partially buried in the substrate is formed as an elongate, two-dimensionally tapered waveguide channel.

17. The method of claim 12, wherein the step of providing a substrate comprises providing a substrate comprising sodium cations; and

wherein the step of providing an ionic liquid comprises providing a melt comprising sodium nitrate.

18. The method of claim 12, further comprising:

removing a portion of the first waveguide channel to form a trench, the trench being configured to receive an optical element; and

arranging an optical element at least partially within the trench, the optical element being configured to communicate optically with the first waveguide channel.

19. The method of claim 12, further comprising:

optically coupling an input transmission medium to the first waveguide channel, the input transmission medium being configured to propagate light to the first waveguide channel; and

optically coupling an output transmission medium to the first waveguide channel, the output transmission medium being configured to propagate light from the first waveguide channel.

20. A waveguide component formed by the process of claim 12.

21. The method of claim 12, further comprising:

depositing on the substrate a second contoured channel preform of material capable of ion exchange with the substrate; and

diffusing ions from the second channel preform into the substrate to form a second waveguide channel at least partially buried in the substrate.

22. The method of claim 21, further comprising:

forming a trench along a light propagation path between the first waveguide channel and the second waveguide channel, the trench being configured to receive an optical element; and

arranging an optical element at least partially within the trench, the optical element being configured to communicate optically with the first waveguide channel and the second waveguide channel.